



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,902	02/10/2006	Koji Abe	285805US0PCT	7273
22850	7590	10/20/2009	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			WEINER, LAURA S	
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
10/20/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/567,902	ABE ET AL.
	Examiner /Laura S. Weiner/	Art Unit 1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 07 July 2009.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1,2 and 4-20 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-2, 4-20 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/0256/06)  
 Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 1-2, 4-20 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 112***

2. Claims 1-2, 4-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 9 are rejected because it is unclear if the dialkyl oxalate, vinylene carbonate and/or 1,3-propanesultone comprise the nonaqueous solvent because the nonaqueous electrolytic solution comprises the nonaqueous solvent.

Claims 4-6 are rejected because it is unclear if these solvents are in addition to the dialkyl oxalate, vinylene carbonate and/or 1,3-propanesultone solvents because of the way claim 1 is written.

Claim 14 is rejected because the negative electrode material cited in claim 1 is a graphite and this claim which depends from claim 1 allows for a lithium metal, a lithium alloy, thermally decomposed carbon material, a coke, fired organic polymer, carbon fibers, tin or tin compounds and silicon or silicon compounds which are not graphite.

***Claim Rejections - 35 USC § 102***

3. Claims 1-2, 4-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Shizuka et al. (JP 2002-367674, translation).

Shizuka et al. teaches on pages 7-8, [0034-0036], a battery comprising a negative electrode comprising lithium or carbonaceous material such as graphite having a d002 of 0.335-0.337 nm and a positive electrode comprising LiNiO<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub>, etc. Shizuka et al. teaches on page 8, [0037], that the electrodes can further include conducting materials such as graphite, carbon black, etc. Shizuka et al. teaches on page 10, [0045], of the translation an electrolyte comprising 3:7 volume ratio of EC:DEC and 2wt% dimethyl malonate and 2 wt% vinylene carbonate. Shizuka et al. teaches on page 7, [0033], that the lithium salt can be LiPF<sub>6</sub>, LiB<sub>4</sub>, etc. Shizuka et al. teaches on page 3, that the solvent can be ethyl methyl carbonate, propylene carbonate, gamma-butyrolactone, etc. Shizuka et al. teaches on page 9, [0041], that a porous separator having a thickness of 25 um is between the anode and cathode where the cathode comprises a 20 um aluminum foil current collector and the negative electrode comprises a 20 um copper foil current collector.

***Claim Rejections - 35 USC § 103***

4. Claims 8, 15-16 and 20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious Shizuka et al. (JP 2002-367674, translation).

Shizuka et al. teaches on pages 7-8, [0034-0036], a battery comprising a

negative electrode comprising lithium or carbonaceous material such as graphite having a d002 of 0.335-0.337 nm and a positive electrode comprising LiNiO<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub>, etc. Shizuka et al. teaches on page 8, [0037], that the electrodes can further include conducting materials such as graphite, carbon black, etc. Shizuka et al. teaches on page 10, [0045], of the translation an electrolyte comprising 3:7 volume ratio of EC:DEC and 2wt% dimethyl malonate and 2 wt% vinylene carbonate. Shizuka et al. teaches on page 7, [0033], that the lithium salt can be LiPF<sub>6</sub>, LiB<sub>4</sub>, etc. Shizuka et al. teaches on page 3, that the solvent can be ethyl methyl carbonate, propylene carbonate, gamma-butyrolactone, etc. Shizuka et al. teaches on page 9, [0041], that a porous separator having a thickness of 25 um is between the anode and cathode where the cathode comprises a 20 um aluminum foil current collector and the negative electrode comprises a 20 um copper foil current collector.

Since Shizuka et al. teaches the same battery comprising a positive electrode which contains LiNiO<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub> on an aluminum foil, a negative electrode comprising graphite on a copper foil, a porous separator and the exact same electrolyte comprising 2wt% dimethyl malonate and 2 wt% vinylene carbonate then inherently the same positive electrode which contains a lithium compound metal oxide showing an open circuit voltage of at least 4.3 V on the basis of Li after completion of charging; a separator having an air permeability of 50-1000 seconds/100 cc and a cathode density of 3.2-4.0 g/cm<sup>3</sup> and an anode density of 1.3-2.0 g/cm<sup>3</sup> must also be obtained.

In addition, the presently claimed property of positive electrode which contains a lithium compound metal oxide showing an open circuit voltage of at least 4.3 V on the

basis of Li after completion of charging; a separator having an air permeability of 50-1000 seconds/100 cc and a cathode density of 3.2-4.0 g/cm<sup>3</sup> and an anode density of 1.3-2.0 g/cm<sup>3</sup> would have obviously have been present once the Shizuka et al. product is provided. *In re Best*, 195 USPQ 433 (CCPA 1977).

5. Claims 8, 15-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shizuka et al. (JP 2002-367674, translation).

Shizuka et al. teaches on pages 7-8, [0034-0036], a battery comprising a negative electrode comprising lithium or carbonaceous material such as graphite having a d002 of 0.335-0.337 nm and a positive electrode comprising LiNiO<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub>, etc. Shizuka et al. teaches on page 8, [0037], that the electrodes can further include conducting materials such as graphite, carbon black, etc. Shizuka et al. teaches on page 10, [0045], of the translation an electrolyte comprising 3:7 volume ratio of EC:DEC and 2wt% dimethyl malonate and 2 wt% vinylene carbonate. Shizuka et al. teaches on page 7, [0033], that the lithium salt can be LiPF<sub>6</sub>, LiB<sub>4</sub>, etc. Shizuka et al. teaches on page 3, that the solvent can be ethyl methyl carbonate, propylene carbonate, gamma-butyrolactone, etc. Shizuka et al. teaches on page 9, [0041], that a porous separator having a thickness of 25 um is between the anode and cathode where the cathode comprises a 20 um aluminum foil current collector and the negative electrode comprises a 20 um copper foil current collector.

Shizuka et al. also does not specifically teach the separator having a porosity of 30-60% or having an air permeability of 50-1000 seconds/100 cc or a cathode density of

3.2-4.0 g/cm<sup>3</sup> and an anode density of 1.3-2.0 g/cm<sup>3</sup>, but it would be within the skill of the ordinary person to adjust porosity to 30-60% or adjust the air permeability to 50-1000 seconds/100 cc or adjust the cathode density to 3.2-4.0 g/cm<sup>3</sup> and the anode density to 1.3-2.0 g/cm<sup>3</sup>, depending on the efficiency and cost requirements.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a separator porosity of 30-60% or have an air permeability of 50-1000 seconds/100 cc or a cathode density of 3.2-4.0 g/cm<sup>3</sup> and an anode density of 1.3-2.0 g/cm<sup>3</sup>, since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a separator porosity of 30-60% or have an air permeability of 50-1000 seconds/100 cc or a cathode density of 3.2-4.0 g/cm<sup>3</sup> and an anode density of 1.3-2.0 g/cm<sup>3</sup>, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Laura S. Weiner/ whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Laura S Weiner/  
Primary Examiner  
Art Unit 1795

October 13, 2009